E-8 WATER DIVERSION

PURPOSE & APPLICATIONS

A diversion is a channel constructed across the slope to divert excess concentrated and sheet surface water, and possibly subsurface water, from areas under construction or development, to sites where it can be used or disposed of. This practice applies to sites where:

- A diversion is required to control erosion and runoff on construction sites.
- Concentrated runoff from higher lying areas is potentially damaging to a developing area.
- Overland (sheet) surface flow and shallow subsurface flow caused by seepage is potentially damaging to areas under construction.
- Runoff is in excess and a diversion is required as part of a pollution abatement system.
- Diversions shall not be substituted for terracing or land grading where such practices are more appropriate for erosion control.

CONSIDERATIONS

Every effort should be made to incorporate the diversion into the plans for parking lots, ball fields, recreation areas, and back yards in such a way that maintenance will be enhanced and multiple use of the area made possible. The diversion may be planned to provide grasses and legumes as an element in wildlife upland habitat management.

- Diversions should not be substituted for terracing or land grading where such practices are more appropriate for erosion control. Diversions shall not be used below high sediment-producing areas unless land treatment practices or structural measures, designed to prevent damaging accumulations of sediment in the channels, are installed with or before the diversions. The exceptions are where a diversion is used to divert sediment-laden water to a sedimentation facility.
- In sensitive watersheds it will be necessary for temporary diversions to have a temporary mulch liner (erosion control blanket) and where feasible, to empty into a sediment trap or basin prior to emptying into a stable outlet. Refer to the TEMPORARY MULCHING BMP. Temporary diversions can deteriorate water quality if they are left bare for extended periods of time.
- Where diversions carry concentrated flow, their outlets may require treatment or a structure to dissipate energy and re-disperse the flow or re-create sheet flow into areas of undisturbed forest floor where sediment can be filtered and runoff absorbed.

SPECIFICATIONS

Design Specifications

Refer to the detail drawing located at the back of this section for the proper design of a water diversion.

- **Cross section:** The channel may be parabolic, V-shaped, or trapezoidal. The diversion must be designed to have stable side slopes. The ridge height must include a reasonable settlement factor (10% is recommended). The ridge should have a minimum top width of 4 ft at the design elevation. The top of the constructed ridge shall not be lower at any point than the design elevation plus the specified overfill for settlement.
- **Grade and velocity**: Channel grades may be uniform or variable. Channel velocity shall not exceed what is considered non-erosive for the soil and planned vegetative treatment.
- **Location**: The condition of the outlet area, site topography, land use, soil type, and length of slope should determine the location of the diversion.
- **Outlets**: Each diversion must have an adequate outlet. The outlet must convey runoff to a point where outflow will not cause damage. The vegetative outlets should be installed and stabilized before the construction of the diversion to ensure establishment of vegetative cover

in the outlet channel. The design elevation of the water surface in the diversion should not be lower than the design elevation of the water surface in the outlet at their junction when both are operating at the design flow.

- **Capacity:** Diversions designed to protect urban areas, buildings, and roads shall have enough capacity to carry the peak runoff expected from a storm frequency consistent with the hazard involved of a 10-year frequency at a minimum. For higher risk areas, the design storm may need to be greater (i.e. 100-year storm for the potential loss of life).
- **Vegetation**: Disturbed areas shall be established to grass immediately after construction. If the soils or winter conditions preclude the use of vegetation and protection is needed, non-vegetative means, such as erosion control mats or gravel may be used. Seedbed preparation, seeding, fertilizing, and mulching shall comply with recommendations in the PERMANENT VEGETATION BMP. Seeding should be completed by September 1st to assure good cover over fall and winter months.

Construction Specifications

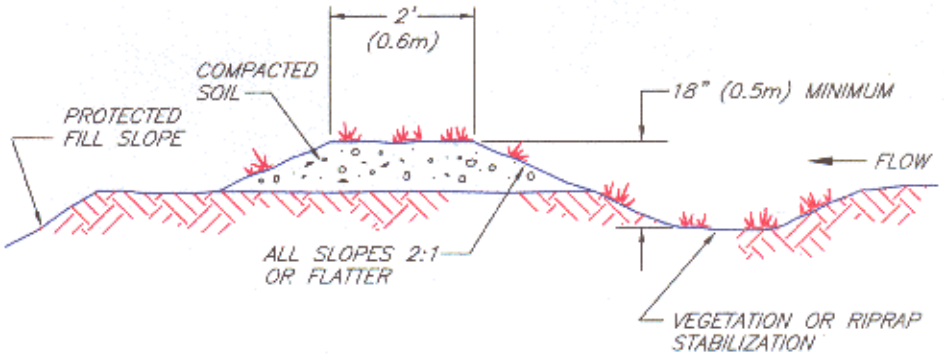
All ditches or gullies shall be filled, and trees and other obstructions shall be removed before construction begins or shall be part of the construction.
If underground conduits are located under diversion ridges, mechanical compaction, water packing, and installation and backfill of conduit trenches shall be made in advance to allow adequate settlement. The materials used for the inlet and conduit shall be suitable for the purpose intended. Diversion ridges constructed across gullies or depressions shall be compacted to ensure proper functioning of the diversion.
Seeded areas need protection during establishment and will be mulched in accordance to the TEMPORARY MULCHING BMP.
Diversions must be completely stabilized prior to directing runoff to them.

Schedule of Installation

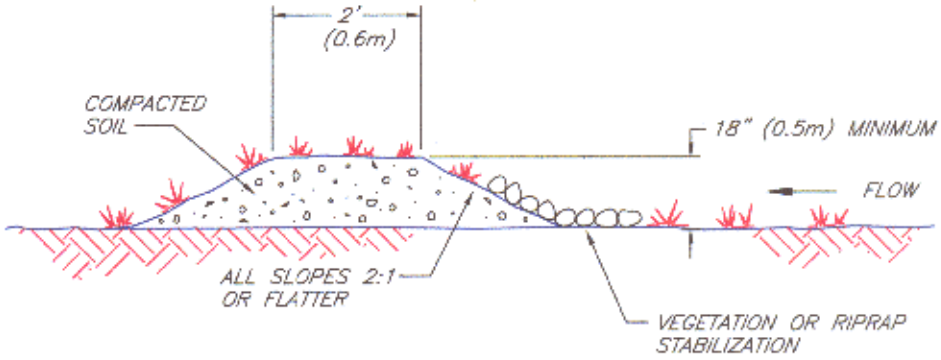
Once soil is exposed for a diversion channel, it should be immediately shaped, graded and stabilized.
Vegetated diversions need to be stabilized early during the growing season (prior to September 1st). If final seeding of diversions is delayed past September 1st, emergency provisions such as sod or riprap may be required to stabilize the channel.

MAINTENANCE

A maintenance program should be established to maintain diversion capacity, storage, ridge height, vegetative cover, and the outlets. Diversion ridges can be hazardous to mow. Any hazards must be brought to the attention of the responsible person.
Mow the diversion at least once annually. Mow to a height of 4-6 inches to help maintain good surface protection.



TYPICAL FILL DIVERSION



TYPICAL TEMPORARY DIVERSION DIKE

NOTES:
1. THE CHANNEL BEHIND THE DIKE SHALL HAVE POSITIVE GRADE TO A STABILIZED OUTLET.
2. THE DIKE SHALL BE ADEQUATELY COMPACTED TO PREVENT FAILURE.
3. THE DIKE SHALL BE STABLILIZED WITH TEMPORARY OR PERMANENT SEEDING OR RIPRAP.

TEMPORARY DIVERSION DIKE

FILE: TEMPDIKE